BEFORE
THE PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

DOCKET NO. 2019-184-E

IN RE:	South Carolina Energy Freedom Act (H.3659) Proceeding to Establish Dominion Energy South Carolina, Incorporated's Standard Offer, Avoided Cost Methodologies, Form Contract Power Purchase Agreements, Commitment to Sell Forms, and Any Other Terms or Conditions Necessary (Includes Small Power Producers as Defined in 16 United States Code 796, as Amended) – S.C. Code Ann. Section 58-41-20(A)	**PROPOSED ORDER OF THE SOUTH CAROLINA OFFICE OF REGULATORY STAFF**

I. INTRODUCTION

This matter comes before the Public Service Commission of South Carolina ("the Commission") pursuant to the requirements in the South Carolina Energy Freedom Act ("Act 62").[1] According to Act 62,

> [a]s soon as is practicable after the effective date of this chapter, the commission shall open a docket for the purpose of establishing each electrical utility's standard offer, avoided cost methodologies, form contract power purchase agreements, commitment to sell forms, and any other terms or conditions necessary to implement this section.…Within such proceeding the commission shall approve one or more standard form power purchase agreements for use for qualifying small power production facilities not eligible for the standard offer. …The commission may approve multiple form power purchase agreements to accommodate various generation technologies and other project-specific characteristics.…Any decisions by the commission shall be just and reasonable to the ratepayers of the electrical utility, in the public interest, consistent with PURPA and the Federal Energy Regulatory Commission's implementing regulations and orders, and nondiscriminatory to small power producers; and shall strive to reduce the risk placed on the using and consuming public….

[1] South Carolina Energy Freedom Act, H. 3659, 123rd Legislative Session (2019 S.C. Act 62).

See S.C. Code Ann. § 58-41-20 (2019).

Under Act 62, the Commission is expressly directed to consider and promote South Carolina's policy of encouraging renewable energy and ensuring the promotion of the public interest while ensuring that no costs or expenses incurred by Dominion Energy South Carolina, Incorporated ("DESC" or "Company") in compliance with Act 62 are then borne by the Company's general body of South Carolina customers without an affirmative finding, which authorizes such cost shift, made by the Commission.[2]

PROCEDURAL HISTORY

On May 23, 2019, the Commission staff opened Docket No. 2019-176-E, to initiate a proceeding pursuant to Act 62 to "establish each electrical utility's standard offer, avoided cost methodologies, form contract power purchase agreements ("PPAs"), commitment to sell forms, and any other terms and conditions necessary" as required by newly enacted S.C. Code Ann. § 58-41-20(A) (the "Public Utility Regulatory Policies Act of 1978 ("PURPA") Implementation and Administrative Provisions"). By Order No. 2019-524, the Commission closed Docket No. 2019-176-E. On May 30, 2019 the Commission opened this Docket to establish DESC's standard offer, avoided cost methodologies, form contract power purchase agreements, commitment to sell forms, and any other terms or conditions required under S.C. Code Ann. § 58-41-20(A).

Johnson Development Associates, Inc. ("Johnson Development" or "JDA") filed a petition to intervene on June 13, 2019. The South Carolina Solar Business Alliance, Inc. ("SBA") filed a petition to intervene on June 14, 2019. The South Carolina Coastal Conservation League and Southern Alliance for Clean Energy ("SACE/CCL") filed a petition to intervene on July 12, 2019. Walmart, Inc. ("Walmart") filed a petition to intervene on July 30, 2019. The South Carolina

[2] *See* S.C. Code Ann. § 58-41-20(F)(2), S.C. Code Ann. § 58-41-20(G), and Section 16 of Act 62.

Energy Users ("SCEUC") petitioned to intervene on August 7, 2019. Ecoplexus, Inc. petitioned to intervene on August 12, 2019. The Commission granted all petitions to intervene. The South Carolina Office of Regulatory Staff ("ORS") is a party by statute.

After notice to all parties and any party with a pending Petition to Intervene, the Commission held an Advisory Committee[3] meeting to discuss Act 62 and related procedural and scheduling issues on June 14, 2019. On July 17, 2019, the Commission heard oral arguments regarding procedural scheduling issues in this matter including, among other things, whether to consolidate the issues in this docket with those of Docket Nos. 2019-185-E and 2019-186-E pertaining to Duke Energy Carolinas, LLC and Duke Energy Progress, LLC. On July 17, 2019, in Order No. 2019-524, the Commission decided against consolidating these three dockets and established pre-filed testimony deadlines and hearing dates for the individual dockets.

Act 62 authorized the Commission to hire an independent third-party consultant to evaluate avoided cost rates, methodologies, terms, calculations, and conditions. *See* S.C. Code Ann. § 58-41-20(I). The Commission initially retained Pegasus Global Holdings, Inc. to serve as its independent expert after a vetting process. However, Pegasus failed to disclose certain conflicts of interest, and the Commission discharged Pegasus on August 7, 2019. *See* Order No. 2019-557. On August 12 and 19, 2019, the Commission held Special Commission Business Meetings to receive presentations from and to publicly interview prospective independent third-party consultants. The Commission also permitted the parties of record to submit proposed written questions concerning each of the proposed candidates. See Order No. 2019-557. By Order No. 2019-585, on August 21, 2019, the Commission also permitted the parties of record to submit

[3] The Commission Advisory Committee is an ad hoc Committee made up of members of the Bar who regularly appear before the Commission. Meetings of the Advisory Committee are called on an as needed basis by the Chief Clerk of the Commission to discuss suggestions for improvements to the Commission's processes and operations.

comments on the public interviews of the prospective third-party consultants. After this in-depth process, the Commission selected John Dalton of Power Advisory, LLC on August 28, 2019 to serve as the independent third-party consultant to advise the Commission on the issues under consideration in this Docket. *See* Order No. 2019-621.

On August 23, 2019 the Company filed the Direct Testimony of seven (7) witnesses, John Raftery, James Neely, John Folsom, Dr. Matthew Tanner, Dr. Joseph Lynch, Eric Bell, and Allen Rooks. On September 20, 2019, the Company filed amended versions of the direct testimony of witnesses James W. Neely, John E. Folsom, Jr., and Allen W. Rooks to correct certain inadvertent errors that were contained in the versions of testimony filed on August 23, 2019.

Intervenors SBA, SACE/CCL, and JDA along with ORS all filed Direct Testimony with the Commission on September 23, 2019.[4] Intervenor JDA filed Direct Testimony of Rebecca Chilton. The SBA filed the Direct Testimony of Steven Levitas, Ed Burgess, Hamilton Davis, and Jon Downey. SACE/CCL filed Direct Testimony of Derek P. Stencilk. ORS filed the Direct Testimony of witnesses Brian Horii and Robert Lawyer.

On September 13, 2019, the Commission issued Order Nos. 2019-104-H and 2019-105-H which set a due date for the filing of pre-hearing briefs and any responses. On September 16, 2019, via an e-mail correspondence, Commission staff "strongly encouraged" parties to file pre-hearing briefs. *See* E-mail from David Stark sent to all parties on September 16, 2019. Commission Order No. 2019-107-H amended the due date for initial pre-hearing briefs in this docket to September 30, 2019 and for reply briefs to October 8, 2019.

[4] On September17, 2019, the Hearing Officer issued Order No. 2019-106-H, granting ORS's request for an extension until September 23, 2019 for all intervenors to pre-file responsive Direct Testimony of their witnesses. Likewise, DESC's time to pre-file Rebuttal Testimony was extended to Monday, October 7, 2019.

On October 7, 2019 the Company also filed the Rebuttal Testimony of eight (8) witnesses, Allen Rooks, Eric Bell, Thomas Hanzlik, Dr. Joseph Lynch, Dr. Matthew Tanner, James Neely, Daniel Kassis[5] and John Raftery.

On October 11, 2019, Intervenors filed Surrebuttal Testimony. ORS filed the Surrebuttal Testimony of Brian Horii and Robert Lawyer; JDA of Rebecca Chilton, SBA of Edward Burgess, Steven Levitas, and Hamilton Davis; and SACE/CCL of Derek Stenclik.[6] Walmart, Ecoplexus, and the SCEUC intervened but did not file testimony.

The merits hearing commenced at 9:00 am on Monday October 14, 2019 in the Commission's hearing room located at 101 Executive Center Drive, Suite 100, Columbia, South Carolina, and concluded on Tuesday, October 15, 2019.

DESC presented John Raftery and Daniel Kassis for its first panel of witnesses. Witness Raftery testified about the requirements of Act 62, gave a brief overview of DESC's position and responded to issues raised in the testimony of witnesses Horii, Stenclik, Chilton, Davis, and Burgess. Witness Kassis, through his adoption of the Amended Direct Testimony of John E. Folsom, Jr. and his own Rebuttal Testimony, testified about DESC's Form PPA, Standard Offer, the Notice of Commitment Form, and responded to issues raised in the testimony of witnesses Horii, Lawyer, and Levitas.

DESC's second panel was Eric Bell and Thomas Hanzlik. Witness Bell testified about the inputs DESC provided to Navigant Consulting, Inc. ("Navigant") for use in its "Cost of Variable Integration" study ("Navigant Study") and responded to issues raised by witnesses Horii, Stenclik, and Burgess. Witness Hanzlik provided Rebuttal Testimony in response to assertions made by

[5] In his Rebuttal Testimony witness Kassis adopted the Direct Testimony of witness Folsom.
[6] SBA submitted amended Surrebuttal Testimony of Ed Burgess and Steven Levitas on October 12, 2019.

SACE/CCL witness Stenclik regarding DESC's need for operating reserves and its options to respond to operational challenges associated with intermittent or variable solar generation.

DESC presented Dr. Joseph M. Lynch, Dr. Matthew Tanner, and James Neely as its third panel. Witness Lynch testified about the analyses supporting the resource plan used to calculate DESC's avoided cost and responded to the testimony of witnesses Horii and Burgess. In witness Tanner's testimony, he discussed the findings and conclusions in the Navigant Study and responded to the testimony of witnesses Horii, Stenclik, and Burgess. Witness Neely testified about the calculations for DESC's avoided cost calculations and responded to issues raised by witnesses Horii, Chilton, Burgess, and Levitas.

The hearing resumed on Tuesday, October 15, 2019 with DESC presenting their final witness, Allen Rooks, who testified about DESC's proposal for the avoided costs true-up and responded to recommendations for tariff language made by ORS witness Lawyer that DESC ultimately agreed to adopt.

SBA and JDA next presented a joint panel with Steve Levitas testifying for SBA and Rebecca Chilton for JDA. Witness Levitas testified about his extensive experience with PURPA and how DESC agreed to adopt several recommendations that he made in order to strike a more fair and reasonable balance between QFs, the Company, and its ratepayers. Witness Levitas testified about SBA's remaining concerns with DESC's proposal including liquidated damages, a guaranteed energy production value on QFs of 85 percent, and lack of energy storage protocol, among other issues. Witness Chilton testified about the fair and reasonable balance the Commission is to consider in its decision, and the issues with DESC's proposal that do not yield a fair and reasonable approach for the QFs and ratepayers.

SBA presented as its next panel of witnesses Ed Burgess, Hamilton Davis, and Jonathan Downey. Witness Burgess testified due to DESC's opportunity to earn a rate of return for its shareholders, DESC has an inherent incentive to pursue low avoided cost rates, which limits the deployment of QF resources. In his testimony, witness Burgess provided alternative calculations for the avoided cost rates for energy and capacity for the Commission to consider. Witness Davis testified how Act 62 is a reset of utility regulation that provides the Commission with more direction and discretion regarding energy development in the state. Witness Davis testified that, while SBA has a financial incentive in the outcome of this proceeding, generation owned by small power producers benefit customers because they are shielded from the risks associated with utility-owned generation. As the president and CEO of Southern Current, LLC, Witness Downey testified about the economic development perspective of companies like Southern Current, and how they are valuable to ratepayers by reducing risks and increasing stability in electricity rates. Derek Stenclik testified on behalf of SACE/CCL about the methodology DESC used to calculate its Variable Integration Charge ("VIC") and recommended the Commission reject the VIC as unsupported and inappropriate at this time.

ORS presented its first witness, Brian Horii, via livestream. Witness Horii testified the Navigant Study is overly risk averse by focusing on just solar generation and not considering the totality of risk that involves all generation, transmission, and demand. Witness Horii provided several recommendations in his testimony for an appropriate VIC and avoided costs calculations. Witness Lawyer testified DESC's proposal included all the appropriate filings required by Act 62 and that the recommendations put forth by witness Horii are reasonable to ratepayers and consistent with PURPA and FERC regulations.

At the close of the hearing and then by follow-up email to Commission Counsel Mr. Stark with copy to all parties, counsel for JDA proposed a time for the intervenors to submit proposed commercially reasonable fixed price power purchase agreements with a duration longer than ten years and with additional terms, conditions, and/or rate structures for approval by the Commission pursuant to S.C. Code Ann. § 58-41-20(F)(1). *See* Order No. 2019-126-H. Mr. Stark established a deadline to comment on the proposal of October 28, 2019. DESC submitted a response brief in opposition and ORS a letter of no objection. On October 31, 2019, Mr. Stark directed that any such proposals should be provided in the party's proposed order. Order No. 2019-128-H.

Power Advisory published its independent third-party report on November 4, 2019. Comments on the Power Advisory report as well as proposed orders were due to the Commission by November 12, 2019.

II. STATUTORY STANDARDS AND REQUIRED FINDINGS

On May 16, 2019, the Governor of South Carolina signed Act 62 into law. Act 62 pertains to a range of issues related to the expansion of renewable energy generation and utility resource planning, and it provides this Commission with both increased direction and discretion in determining the most appropriate path forward for energy development in South Carolina.

Act 62 directs the Commission "to address all renewable energy issues in a fair and balanced manner, considering the costs and benefits to all customers of all programs and tariffs that relate to renewable energy and energy storage, both as part of the utility's power system and as direct investments by customers for their own energy needs and renewable goals." S.C. Code § 58-41-05 (2019 S.C. Act 62). The Commission must also ensure that utilities' rate designs "are just and reasonable and properly reflect changes in the industry as a whole, the benefits of customer renewable energy, energy efficiency, and demand response, as well as any utility or state-specific

impacts unique to South Carolina[.]" *Id.* Specifically with respect to avoided cost, new S.C. Code § 58-41-20(A) instructs that "any decisions by the commission shall be just and reasonable to the ratepayers of the electrical utility, in the public interest, consistent with PURPA and the FERC's implementing regulations and orders, and nondiscriminatory to small power producers; and shall strive to reduce the risk placed on the using and consuming public."

Act 62 provides that any power purchase agreements or other terms and conditions for QFs are commercially reasonable and consistent with PURPA and FERC's implementing regulations and orders. S.C. Code Ann. § 58-41-20(A), (B)(2).

Additionally, the Act requires that

> no costs or expenses incurred nor any payments made by the electric utility in compliance or in accordance with this act must be included in the electrical utility's rates or otherwise borne by the general body of South Carolina retail customers of the electrical utility without an affirmative finding supported by the preponderance of evidence of record and conclusion in a written order by the Public Service Commission that such expense, cost or payment was reasonable and prudent and made in the best interest of the electrical utility's general body of customers.

2019 S.C. Act 62, § 16.

III. REVIEW OF THE EVIDENCE AND FINDINGS OF FACT

1. Avoided Energy Costs

In his direct testimony, ORS witness Horii testified that in his professional opinion DESC has created a confusing case due to integration costs being calculated in one manner by Navigant for the VIC and then calculated by a different method using different assumptions for Rate PR-1 and Standard Offer rates. Tr. p. 695.9, ll. 5-12. He also testified that the VIC study used by the Company is overly risk adverse in determining the need for additional operating reserves to account for the intermittency of solar generation. Tr. p. 695.10, ll. 19-23. SACE/CCL witness Stenclik testified while it is appropriate to have some operating reserves, overly stringent reserve

requirements could burden ratepayers, lead to unnecessary operating costs, and limit the growth of the solar industry with only marginal or no benefits to overall reliability. Tr. p. 640.2, l. 22 to p. 640.3, l. 9. DESC witness Tanner disagrees with Mr. Horii and Mr. Stenclik that the VIC study overstates the risk of variable generation.

We believe that the evidence presented in this case established that the Navigant Study is not only excessively risk adverse, but that it also overstated operating reserve by holding reserve levels constant during all the hours when solar is operational. Witness Horii did, however, undertake to assign a more reasonable level of additional reserves to the Navigant data to reduce the VIC from the Company proposed $4.14/MWh to $2.29/MWh. Tr. p. 695.18, ll. 1-10 to p. 695.9, l. 4. We find the rationale and data presented by witness Horii to be persuasive and adopt his recommended VIC. We find witness Horii's recommendations to be less risk averse, to be just and reasonable to DESC's ratepayers, in the public interest, consistent with PURPA and FERC regulations, and nondiscriminatory to small power producers. *See*. S.C. Code Ann. § 58-21-40((A). We also agree with the recommendation of both witnesses Stenclik and Horii that the Company seek stakeholder input in the performance of its next analysis before imposing the increased cost of the solar projects being developed in DESC's territory on its ratepayers. *See,* Tr. p. 640.16, ll. 7-13 and Tr. p. 695.23, ll. 14-18.

For Rate PR-1 and Standard Offer rates, DESC has proposed to reflect integration costs through a reduction in the avoided energy rates provided to solar QFs. ORS witness Horii's testimony discussed the flaws of the Company's proposal for integration costs for Rate PR-1 and Standard Offer rates. Witness Horii testified the assumptions used overstate the risk, in turn inflating the resulting integration costs. Tr. p. 695.10, ll. 21-22. He recommends that the Commission not adopt the integration-related costs for Rate PR-1 and Standard Offer rates as

proposed by DESC. Tr. P. 695.10, l. 19 to p. 695.11, l.11. We find Mr. Horii's testimony on this matter to be persuasive and adopt his recommendations. Mr. Horii's recommendations provide a more balanced approach that comports with the provisions of Act 62.

The Company calculates avoided energy costs, as described by DESC witness Neely in his direct testimony, by using a methodology known as the Difference in Revenue Requirements ("DRR"). Tr. p. 308.7, l. 19 to p. 308.8, l. 16. The DRR method calculates the revenue requirements associated with two (2) different resource plan scenarios: a base case without a QF, and a change case with a QF. Tr. P. 695.24, l. 21 to p. 695.25, l. 13. This is one of the generally accepted methods for calculating PURPA avoided energy costs and is used throughout the United States. It is the same methodology used by DESC in Docket No. 2018-2-E and approved by the Commission in Order No. 2018-322(A), and ORS believes that it is reasonable to use a solar profile for solar specific QFs. Tr. p. 695.25, ll. 17-20. However, ORS witness Horii disagrees with the inputs and assumptions that DESC employed in developing their avoided energy cost estimates. *Id*. at ll. 20-22. DESC overstated the need for additional operating reserves to accommodate the integration of solar resources. The additional operating reserves reduce the net avoided energy costs estimated for solar resources. Therefore, an overestimation of the need for additional operating reserves incorrectly changes the avoided energy cost rates for solar resources. Tr. p. 695.27, ll. 10-14.

ORS witness Horii identified three main concerns with the Company's calculation of proposed avoided energy costs:

1) The Company overstated the amount of operating reserves required for the incremental 100 MW of solar in the change case;

2) The Company's modeling requires operating reserves to provide solar integration services instead of potentially lower cost types of reserves; and

3) The Company's use of flawed assumptions yields inconsistent results.

Tr. p. 695.27, ll. 17-23.

To correct these concerns ORS witness Horii recommends that avoided energy costs not be adjusted for additional operating costs for solar projects. Instead, he recommended that avoided energy costs should be estimated like in Docket No. 2018-2-E, based on the normal operating reserve level (no additional operating reserve requirement) for both the base case and the solar change case. Tr. p. 695.30, ll. 6-9. As before, we find that Mr. Horii's testimony is convincing and presents reasonable objections to DESC's modeling assumptions. We find that by overstating the operating reserves, DESC created artificially low avoided energy costs. We further find and adopt Mr. Horii's recommendation stated above that avoided energy costs be based on normal operating reserve levels.

Based on the above referenced testimony, the Commission hereby approves as just and reasonable the following avoided energy rates:

	Time Period	**Avoided Energy Rates ($/kWh)**
Rate PR-1 Avoided Energy Rates for Solar QFs	May 2019 - April 2020	.03114
Rate PR – Standard Offer	2020 - 2024	.02112
Rae PR – Standard Offer	2025 - 2029	.02375

2. Avoided Capacity Value

DESC also calculated the avoided cost of capacity using the DRR method to quantify the avoided cost of generation capacity. Tr. p. 308.7, l. 21 to p. 308.8, l. 2. The DRR methodology is one of the generally accepted methods for calculating PURPA avoided capacity costs and is used throughout the United States. It is the same methodology used by DESC in Docket No. 2018-2-E and approved by the Commission in Order No. 2018-322(A). However, ORS disagrees with

certain inputs and assumptions that DESC employed in developing their avoided capacity cost estimates. ORS's concerns and corrections are discussed in detail in ORS witness Horii's direct testimony. Mr. Horii notes that DESC understates the avoided capacity cost estimates due to the following incorrect assumptions: 1) an incorrect reserve margin, 2) excessive and inconsistent use of low cost capacity purchases, 3) an overly long combustion turbine ("CT") life, and 4) a mismatch between the avoided cost resource change and the assumed size of a CT unit. Tr. p. 695.33, l. 20 to p. 695.34, l. 5.

Witness Horii also disagrees with DESC witness Lynch's assertion that incremental solar provides no capacity value in the winter season or that capacity need is driven solely by peak demand. DESC witness Neely states that "only half of the peak days would occur in the winter" evidencing that the Company understands that half of the peak days occur in the Summer months, thus supporting Mr. Horii's use of a summer capacity value. Tr. p. 319.11, l. 20. As Mr. Horii points out, DESC witness Lynch also performed a probabilistic analysis known as the Effective Load Carrying Capacity ("ELCC") method which demonstrates a solar capacity value equal to 24% of nameplate capacity.

In Rebuttal Testimony replying to witness Horii, DESC witness Lynch contends that his Convolution Formula is not overly simplistic but provides nothing in the way of new facts or evidence to support this claim. Tr. p. 283.2, l. 6 to p. 283.3, l. 2. In Surrebuttal, Mr. Horii further defined his argument on this issue in stating that it is not the Convolution Formula itself that is simplistic, but rather the fact that the formula is not the driver of DESC's valuation. Tr. p. 695.10. As Mr. Horii explained to this Commission in his Surrebuttal, DESC's determination of reserve margins performs a simple addition of independent supply risk and demand risk, a simplistic approach which is used in driving its recommendations for avoided capacity costs. *Id*.

Another of the differences in the calculations of avoided capacity between Mr. Horii and Mr. Neely is Mr. Horii's recommendation that a 93MW change in generation should be used as opposed to the 100MW used by the Company. Tr. p. 695.39, ll. 7-14. While Mr. Horii's use of a 93MW change is based on his specific calculations, Mr. Neely only supports the Company's use of 100MW.

We find Mr. Horii's testimony on this issue to be compelling and supported by more focused and accurate formulas and considerations than those expressed by the Company's witnesses. Additionally, DESC maintains it is a winter peaking utility, yet DESC witnesses testified that the Company experiences almost as many, if not the same amount, of peaks in the summer as it does in the winter. Testimony in the record supports our finding here that the need for capacity is not a simple comparison of summer versus winter capacity need, but rather capacity needs over the whole year. *See*, Tr. p. 695.34, ll. 20-23.

Based on the above referenced testimony, the Commission hereby approves the following avoided capacity rates as meeting the requirements of S.C. Code Ann. § 58-41-20(A):

Time Period	**Avoided Capacity Rates**
Standard Offer Non-Solar QF's *Dec thru Feb, 6:00am to 9:00am*	$247.25/MWh
Standard Offer Solar QF's *All hours*	$3.79/MWh
Solar with Storage	$7.08/kW per year
Rate PR-1 *Dec thru Feb, 6:00am to 9:00am*	$0.24725/kWh

3. Integration Costs and the Variable Integration Charge ("VIC")

According to witness Horii, the overall concepts of the methodology used in DESC's Navigant Study are reasonable as integrating renewable generation does create additional costs for

utilities. However, he also finds that the Navigant Study performed for the Company is overly risk adverse. Tr. p. 695.10, ll. 21-23. Mr. Horii testified that E3 has observed that increasing amounts of solar and wind generation can require additional ramping capability and reserves to meet both the intermittent nature of solar and wind generation and the diurnal ramping characteristics of solar generation. The cost impact can include higher start-up costs, fuel costs, and operating and maintenance costs resulting from resources operating at levels below their maximum efficiency to allow upward headroom to ramp up output. Costs can also increase for additional generation plant required to provide additional flexible capacity.

ORS witness Horii testified that he considers the Company's analysis to be an acceptable approach to estimating solar integration costs, however, he does make the following observations:

1) The assumptions used by Navigant unreasonably increase the risks of uncertain variable generation to the Company which inflates the resulting variable integration costs. He therefore proposes a more balanced approach which results in a reasonable value for the VIC;
2) The Company failed to conduct an analysis that balances risks and costs in determining the additional amount of operating reserves that would need to be carried due the existence of variable solar resources on the system;
3) The Company is unreasonably risk averse in its determination of the amount of additional operating reserves due to potential solar forecast error; and
4) The Navigant Study overstates operating reserves needed by holding reserve levels constant over each day, rather than allowing operating reserves to reflect how any solar forecast risk would not be at DESC's high estimated levels over the entire day.

Tr. p, 695.8 to p. 695.11.

According to ORS witness Horii, integration costs should be reduced by modifying the Company's methodology in determining the solar forecast uncertainty and applying his calculated 36.2% reduction of forecast uncertainty. Tr. p. 695.21, ll. 4-5. He also recommended to the Commission that DESC be required to conduct a new VIC study, and involve the solar community in that process to allow for an effective and cooperative interchange of ideas. Tr. p. 690, ll. 15-19.

SBA witness Burgess testified that should the Commission approve an integration charge in this case, that it should: 1) be adequately capped, 2) reflect the drivers of the integration costs, 3) based on real-world data, and not projections, and 4) have the ability to be mitigated through appropriate dispatch of solar, storage or other QF technology. Tr. p. 523.90

Forecast uncertainty drives the amount of additional reserves that Navigant has modeled for DESC. Since the forecast uncertainty that needs to be accounted for according to witness Horii is 36.2% less than modeled, the amount of additional reserves for solar should also be 36.2% less than estimated. To convert that reserve change to a cost impact, he referred to Navigant's estimates of integration costs by reserve level. That figure shows that the integration costs can be estimated as a simple linear relationship to additional reserve levels. Because of this linear relationship, the 36.2% reduction in forecast uncertainty results in a 36.2% reduction in integration costs. As a result, witness Horii believes the Company's proposed VIC of $4.14/MWh should be reduced by 36.2% to $2.29/MWh. Tr. p. 695.19. Additionally, witness Horii reviewed the distribution of solar forecast error to determine the percentage of time that forecast error could exceed his recommended level. As provided in his testimony, witness Horii determined that there was a less than 1% chance that solar forecast error would exceed his recommended reduction to DESC's Integration Study estimate by 36.2%. Tr. p. 695.21, l. 10-16.

We believe witness Horii's position is a reasonable balance of risk and costs, especially given his other concerns over the Navigant costs being biased upward. We therefore conclude that, given that less than 1% of hours would only be problematic if there were also the simultaneous problems of lower than expected output from other scheduled generators, limited import ability, and higher than expected customer demand. See, Tr. p. 695.13, l. 20 to p. 695.19, l. 16. We find these recommendations to be just and reasonable to customers, consistent with PURPA and FERC

regulations and orders, non-discriminatory to QFs, and serve to reduce the risk placed on the using and consuming public.

Per the analyses and calculations performed by the ORS witness Horii, the following rates are found to be just and reasonable and are ordered for DESC:

Rate PR-1 Avoided Energy Rate for Solar QFs ($/kWh)	$0.03114
Rate PR-Standard Offer Avoided Energy Rate for Solar QF 2020-2024 ($/kWh)	$0.02112
Rate PR-Standard Offer Avoided Energy Rate for Solar QF 2025-2029 ($/kWh)	$0.2375
Avoided Capacity: Standard Offer Non-Solar QF *December through February, 6:00am to 9:00am*	$247.25/MWh
Avoided Capacity: Standard Offer Solar QF's, *All hours*	$3.79/MWh
Avoided Capacity: Solar with Storage	$7.08/kW per year
Rate PR-1, *Dec. through Feb., 6:00am to 9:00am*	$0.24725/kWh

IV. Order

IT IS THEREFORE ORDERED that based on the above stated findings and conclusions**,**

1) DESC is hereby required to separately state the avoided energy rates from the VIC in the Rate PR-1 and Standard Offer tariffs;
2) The avoided energy rate calculations as detailed above are hereby approved and adopted and Ordered to be implemented by DESC;

3) The Commission adopts the value of $2.29/MWh for the VIC;

4) The avoided capacity rates, as detailed in the above findings, are Ordered and approved as reflecting a fair and unbiased valuation consistent with industry standard assumptions;

In accordance with the above stated Findings and Conclusions, and based on the greater weight of the evidence, we find as a matter of law that our rulings in this matter are in accordance with the stated intent of Act 62 and result in a just and reasonable outcome for the Companies' customers while promoting South Carolina's policy of encouraging renewable energy.

BY ORDER OF THE COMMISSION:

_____
Comer H. Randall, Chairman

_____
Justin T. Williams, Vice-Chairman

(SEAL)